

Cholera

Dysentery (amoebic or bacillary)

Food poisoning

Cholera

- **Caused by *Vibrio cholerae* serotype O1.**
- **Is toxin-mediated bacterial cause of acute watery diarrhea.**
- **The enterotoxin activates adenylate cyclase in the intestinal epithelium, inducing net secretion of chloride and water.**
- ***V. cholerae* O1 has two biotypes, classical and El Tor.**
- **Numbers of cases of cholera have been increasing, with outbreaks in Ghana in 2014 and Tanzania in 2015.**

Cholera

- El Tor is more resistant to commonly used antimicrobials than classical Vibrio, and causes prolonged carriage in 5% of infections.
- Infection spreads via the stools or vomit of symptomatic patients or of the much larger number of subclinical cases.
- Organisms survive for up to 2 weeks in fresh water and 8 weeks in salt water.
- Transmission is normally through infected drinking water, shellfish and food contaminated by flies, or on the hands of carriers.

Cholera

❖ Clinical features :-

- Severe diarrhea without pain or colic begins suddenly and is followed by vomiting.
- Following the evacuation of normal gut fecal contents, typical 'rice water' material is passed, consisting of clear fluid with flecks of mucus.
- Classical cholera produces enormous loss of fluid and electrolytes, leading to intense dehydration with muscular cramps.
- Shock and oliguria develop but mental clarity remains.
- Death from acute circulatory failure may occur rapidly unless fluid and electrolytes are replaced.

Cholera

❖ Clinical features :-

- Improvement is rapid with proper treatment.
- The majority of infections, however, cause mild illness with slight diarrhea.
- Occasionally, a very intense illness, 'cholera sicca', occurs, with loss of fluid into dilated bowel, killing the patient before typical gastrointestinal symptoms appear.
- The disease is more dangerous in children.

Cholera

❖ Clinical features :-

Cholera

❖ **Diagnosis and management :-**

- ❖ **Clinical diagnosis is easy during an epidemic.**
- ❖ **The diagnosis should be confirmed bacteriologically.**
- ❖ **Stool darkfield microscopy shows the typical 'shooting star' motility of *V. cholerae*.**
- ❖ **Rectal swab or stool cultures allow identification.**
- ❖ **Cholera is notifiable under international health regulations.**

Cholera

❖ Diagnosis and management :-

- ❖ Maintenance of circulation by replacement of water and electrolytes is paramount.
- ❖ Ringer-Lactate is the best fluid for intravenous replacement.
- ❖ Vomiting usually stops once the patient is rehydrated, and fluid should then be given orally up to 500 mL hourly.
- ❖ Early intervention with oral rehydration solutions that include resistant starch, based on either rice or cereal, shortens the duration of diarrhea and improves prognosis.

Cholera

❖ **Diagnosis and management :-**

❖ **Severe dehydration, mandates intravenous replacement, as indicated by:-**

✓ **Altered consciousness.**

✓ **Skin tenting.**

✓ **Very dry tongue.**

✓ **Decreased pulses.**

✓ **Low blood pressure.**

✓ **Minimal urine output.**

Cholera

❖ **Diagnosis and management :-**

- ❖ **Total fluid requirements may exceed 50 L over a period of 2–5 days.**
- ❖ **Accurate records are greatly facilitated by the use of a ‘cholera cot’, which has a reinforced hole under the patient’s buttocks, beneath which a graded bucket is placed.**
- ❖ **Three days’ treatment reduces the duration of excretion of *V. cholerae* and the total volume of fluid needed for replacement.**
- ✓ **Tetracycline 250 mg 4 times daily.**
- ✓ **Single dose of doxycycline 300 mg.**
- ✓ **Ciprofloxacin 1 g in adults.**

Cholera

❖ **Diagnosis and management :-**

Cholera

❖ Prevention :-

- ❖ Strict personal hygiene is vital and drinking water should come from a clean piped supply or be boiled.
- ❖ Flies must be denied access to food.
- ❖ Oral vaccines containing killed *V. cholerae* with or without cholera toxin are used in specific settings.
- ❖ In epidemics, improvements in sanitation and access to clean water, public education and control of population movement are vital.
- ❖ Mass single-dose vaccination and treatment with tetracycline are valuable.
- ❖ Disinfection of discharges and soiled clothing, and scrupulous hand-washing by medical attendants reduce spread.

Dysentery

- Dysentery means diarrhea with blood
- The most common causes of dysentery :-

❑ Bacteria ;

- Shigella (bacillary dysentery).
- Enterohaemorrhagic toxin producing E, coli.
- Campylobacter.
- Non-typhoidal salmonella.
- Yersinia enterocolitica.

❑ Parasite

- Amoebic.

Dysentery

❖ Prevention :-

Dysentery

❖ Bacillary Dysentery (shigellosis) :-

- Shigella are Gram-negative rods, closely related to *E. coli*, invade the colonic mucosa.
- Four main groups: *Sh. dysenteriae*, *flexneri*, *boydii* and *sonnei*.
- In the tropics, bacillary dysentery is usually caused by *Sh. flexneri*,
- Shigella are often resistant to multiple antibiotics, especially in tropical countries.
- Only infects humans and its spread is facilitated by its low infecting dose of around 10 organisms.

Dysentery

❖ Bacillary Dysentery (shigellosis) :-

- Spread may occur via:-
 - ✓ Contaminated food or flies.
 - ✓ Person to- person transmission by unwashed hands after defecation is the most important factor.
- Outbreaks occur in psychiatric hospitals, residential schools and other closed institutions, and dysentery is a constant accompaniment of wars and natural catastrophes, which bring crowding and poor sanitation in their wake.
- *Shigella* infection may spread rapidly among men who have sex with men.

Dysentery

❖ Bacillary Dysentery (shigellosis) :-

❖ Clinical features :-

- Varies from mild *Sh. sonnei* infections to more severe *Sh. flexneri* infections, while those due to *Sh. dysenteriae* may be fulminating and cause death within 48 hours.
- In a moderately severe illness, the patient complains of:-
 - ✓ Diarrhea.
 - ✓ Colicky abdominal pain.
 - ✓ Tenesmus.
- Stools are small, and after a few evacuations contain blood and purulent exudate with little fecal material.

Dysentery

❖ Bacillary Dysentery (shigellosis) :-

❖ Clinical features :-

- Fever.
- Dehydration.
- Weakness.
- Tenderness over the colon.
- Reactive arthritis or iritis may occasionally complicate bacillary dysentery.

Dysentery

❖ **Bacillary Dysentery (shigellosis) :-**

❖ **Diagnosis :-**

➤ **Stool culture.**

➤ **PCR.**

➤ **EIA.**

Dysentery

❖ **Bacillary Dysentery (shigellosis) :-**

❖ **Management and prevention :-**

- Oral rehydration therapy if diarrhea is mid or moderate.
- intravenous replacement of water and electrolyte loss is necessary, if diarrhea is severe.
- Zinc if <6y, vitamin A.
- Antibiotic therapy is with ciprofloxacin (500 mg twice daily for 3 days).
- Azithromycin and ceftriaxone are alternatives but resistance occurs to all agents, especially in Asia.

Dysentery

❖ Bacillary Dysentery (shigellosis) :-

❖ Management and prevention :-

- The use of antidiarrheal medication should be avoided.
- The prevention of fecal contamination of food and milk.
- The isolation of cases may be difficult, except in limited outbreaks.
- Hand-washing is very important.

Dysentery

❖ Amoebic Dysentery :-

- Amoebiasis is caused by *Entamoeba histolytica*.
- Spread between humans by its cysts.
- Causes of morbidity and mortality in the tropics and is occasionally acquired in non-tropical countries.
- Two nonpathogenic *Entamoeba* species (*E. dispar* and *E. moshkovskii*) are morphologically identical to *E. histolytica*.
- Only *E. histolytica* causes amoebic dysentery or liver abscess.

Dysentery

❖ Amoebic Dysentery :-

❖ Pathology :-

- ✓ Cysts of *E. histolytica* are ingested in water or uncooked foods contaminated by human faeces.
- ✓ Infection may also be acquired through anal/oral sexual practices.
- ✓ In the colon, trophozoite forms emerge from the cysts.
- ✓ The parasite invades the mucous membrane of the large bowel, producing lesions that are maximal in the caecum but extend to the anal canal.

Dysentery

❖ Amoebic Dysentery :-

❖ Pathology :-

- ✓ These are flask shaped ulcers, varying greatly in size and surrounded by healthy mucosa.
- ✓ A localised granuloma (amoeboma), presenting as a palpable mass in the rectum or a filling defect on radiography, is a rare complication that should be differentiated from carcinoma.
- ✓ Amoebic ulcers may cause severe hemorrhage but rarely perforate the bowel wall.
- ✓ Amoebic trophozoites can emerge from the vegetative cyst from the bowel and be carried to the liver in a portal venule.

Dysentery

❖ **Amoebic Dysentery :-**

❖ **Pathology :-**

- ✓ Can multiply rapidly and destroy the liver parenchyma, causing an abscess.
- ✓ The liquid contents at first have a characteristic pinkish color, which may later change to chocolate-brown (said to resemble anchovy sauce).
- ✓ Cutaneous amoebiasis, rare, causes progressive genital, perianal or peri-abdominal surgical wound ulceration.

Dysentery

❖ Amoebic Dysentery :-

❖ Clinical features :-

➤ Intestinal amoebiasis :-

- ✓ Most amoebic infections are asymptomatic.
- ✓ The incubation period of amoebiasis ranges from 2 weeks to many years.
- ✓ Followed by a chronic course with abdominal pains and two or more unformed stools a day.
- ✓ Offensive diarrhea, alternating with constipation.
- ✓ Blood or mucus in the stool are common.

Dysentery

❖ **Amoebic Dysentery :-**

❖ **Clinical features :-**

➤ **Intestinal amoebiasis :-**

- ✓ **Abdominal pain, especially in the right lower quadrant (which may mimic acute appendicitis).**
- ✓ **A dysenteric presentation with passage of blood.**
- ✓ **A dysentery simulating bacillary dysentery or ulcerative colitis, occurs particularly in older people, in the puerperium and with super-added pyogenic infection of the ulcers.**

Dysentery

❖ Amoebic Dysentery :-

➤ Amoebic liver abscess :-

- ✓ The abscess is usually found in the right hepatic lobe.
- ✓ May not be associated diarrhea.
- ✓ Early symptoms may be only local discomfort and malaise.
- ✓ later, a swinging temperature and sweating may develop.
- ✓ Usually without marked systemic symptoms or signs.

Dysentery

❖ Amoebic Dysentery :-

➤ Amoebic liver abscess :-

- ✓ An enlarged, tender liver, cough and pain in the right shoulder are characteristic but symptoms may remain vague and signs minimal.
- ✓ A large abscess may penetrate the diaphragm, rupturing into the lung, and may be coughed up through a hepatobronchial fistula.
- ✓ Rupture into the pleural or peritoneal cavity, or rupture of a left lobe abscess in the pericardial sac, is less common but more serious.

Dysentery

❖ Amoebic Dysentery :-

❖ Investigations :-

- ✓ Microscopic examination of the stool or any exudate for motile trophozoites.
- ✓ Movements cease rapidly as the stool preparation cools.
- ✓ Several stools may need to be examined in chronic amoebiasis before cysts are found.
- ✓ Sigmoidoscopy may reveal typical flask-shaped ulcers, which should be scraped and examined immediately for *E. histolytica*.
- ✓ In endemic areas, one-third of the population are symptomless passers of amoebic cysts.

Dysentery

❖ Amoebic Dysentery :-

❖ Investigations :-

- ✓ An amoebic abscess of the liver is suspected on clinical grounds;-
 - neutrophil leukocytosis.
 - Raised right hemidiaphragm on chest X-ray.
 - Confirmation is by ultrasonic scanning.

- ✓ Aspirated pus from an amoebic abscess has the characteristic chocolate-brown appearance but only rarely contains free amoebae.

- ✓ Serum antibodies are detectable in over 95% of patients with hepatic amoebiasis and intestinal ameboma, but in only about 60% of dysenteric amoebiasis.

- ✓ DNA detection by PCR has been shown to be useful in diagnosis of *E. histolytica* infections but is not generally available.

Dysentery

❖ Amoebic Dysentery :-

❖ Management and prevention :-

- ✓ Intestinal and early hepatic amoebiasis responds quickly to oral metronidazole.
- ✓ Other long-acting nitroimidazoles like tinidazole or ornidazole.
- ✓ Nitazoxanide is an alternative drug.
- ✓ Either diloxanide furoate or paromomycin, for 10 days after treatment, should be given to eliminate luminal cysts.
- ✓ If a liver abscess is large or threatens to burst, or if the response to chemotherapy is not prompt, aspiration is required and is repeated if necessary.

Dysentery

❖ Amoebic Dysentery :-

❖ Management and prevention :-

✓ Rupture of an abscess into the pleural cavity, pericardial sac or peritoneal cavity necessitates immediate aspiration or surgical drainage.

✓ Small serous effusions resolve without drainage.

➤ Prevention

✓ Personal precautions against contracting amoebiasis include not eating fresh, uncooked vegetables or drinking unclean water.

Food poisoning

➤ Most common causes of toxin and food poisoning:-

- **Bacillus cereus.**
- **Staphylococcus aureus.**
- **Clostridium spp. Enterotoxin.**

Food poisoning

❖ **Bacillus cereus food poisoning :-**

- Ingestion of the pre-formed heat-stable exotoxins of B. cereus.
- Presents with ;-
- ✓ rapid onset of vomiting and some diarrhea within hours of food consumption.
- ✓ Resolves within 24 hours.
- Fried rice and freshly made sauces are frequent sources.
- The organism grows and produces enterotoxin during storage.

Food poisoning

❖ **Bacillus cereus food poisoning :-**

- **Viable bacteria are ingested and toxin formation takes place within the gut lumen.**
- **The incubation period is longer (12–24 hours).**
- **Watery diarrhea and cramps are the predominant symptoms.**
- **The disease is self-limiting but can be quite severe.**
- **Rapid and judicious fluid replacement and appropriate notification of the public health authorities are all that is required.**

Food poisoning

❖ Staphylococcal food poisoning :-

- Staph. aureus is transmitted via the hands of food handlers to foodstuffs.
- Inappropriate storage of these foods allows growth of the organism and production of one or more heat-stable enterotoxins that cause the symptoms.
- Nausea and profuse vomiting develop within 1–6 hours.
- Diarrhea may not be marked.

Food poisoning

❖ Staphylococcal food poisoning :-

- The toxins that cause the syndrome act as 'super-antigens' and induce a significant neutrophil leukocytosis that may be clinically misleading.
- Most cases settle rapidly but severe dehydration can occasionally be life-threatening.
- Antiemetics and appropriate fluid replacement are the mainstays of treatment.
- Suspect food should be cultured for staphylococci and demonstration of toxin production.
- The public health authorities should be notified if food vending is involved.

food poisoning

❖ Clostridium perfringens food poisoning :-

- Spores of *C. perfringens* are widespread in the guts of large animals and in soil.
- *C. perfringens* spores germinate and viable organisms multiply, If contaminated meat products are incompletely cooked and stored in anaerobic conditions, .
- Subsequent reheating of the food causes release of enterotoxin.
- Symptoms (diarrhea and cramps) occur some 6–12 hours following ingestion.
- The illness is usually self-limiting.

food poisoning

❖ Clostridium perfringens food poisoning :-

- Clostridial enterotoxins are potent and most people who ingest them will be symptomatic.
- 'Point source' outbreaks, a number of cases all become symptomatic following ingestion.
- Clostridial necrotizing enteritis (CNE) or pigbel is an often-fatal type of food poisoning caused by a β -toxin of *C. perfringens*, type C.
- The toxin is normally inactivated by certain proteases or by normal cooking.
- Pigbel is more likely in protein malnutrition or in the presence of trypsin inhibitors, either in foods such as sweet potatoes or during infection with *Ascaris* sp. roundworms.



Thank you